

*"We do not take possession of our ideas, but are possessed by them;
They master us and force us into the arena,
Where, like gladiators, we must fight for them.—HEINE.*

The Arena

VOL. 40

AUGUST—SEPTEMBER, 1908

No. 225

THE ALL-CANADIAN FALLS QUESTION.

BY FRANK VROOMAN.

THE QUESTION as to whether the American Falls of Niagara shall be utterly and immediately destroyed has been recently raised by the Canadian government. A monumental work has just been published by the Canadian Geological Survey, written by the eminent scientist, Dr. J. W. W. Spencer, presenting some succinct and startling data in which every American is vitally interested.

Incontrovertible evidence of the most rigidly scientific character has been marshaled in by far the most important work ever published on the subject, which is bound to figure in the future international adjustments between the two countries. The American people more than the people of Canada owe a debt to the Hon. William Templeman, Minister of Mines of Canada, who has not allowed the power interests to suppress facts vital to them, contained in a work projected by Dr. Bell when Director of the Geological Survey, and under the administrative foresight of the Hon. Frank Oliver, Minister of the Interior of Canada.

We are told on a technical authority, which a layman will neither dispute nor

elucidate, that the falls are 39,000 years old; that at first they were only thirty-five feet high, with less than one-sixth the present volume of water, owing to the fact discovered by Dr. Spencer in 1888 that the Huron waters only lately turned into the Erie drainage, when the St. Clair river flowed the other way and the drainage was to the northeast through Georgian Bay.

While flour mills were established on both sides of the Falls at the close of the eighteenth century (even as early as 1750), the real power question was first raised by the incorporation of the Niagara Falls Hydraulic Company in 1853, with priority of use of water. The Niagara Falls Power Company followed in 1886. At this time the water was thought to be unlimited, and there was no suspicion of a possibility of necessary curtailment. Both companies together were allowed 27,200 cubic feet per second, which would yield approximately 200,000 net electrical horse-power for each company. The Hydraulic Company takes its water by surface canal from a point above the Upper Rapids (one and one-half miles above the Falls) and conveys it to a point

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below the American Falls, where the water falls in the river below, where the least amount of power may be lost. The Niagara Falls Power Company takes its water from near the same point, and conveys it directly to its wheel-pit, from the bottom of which there is a waste weir tunnel about one and a quarter miles long, where the water re-enters the river. The mean discharge of the entire Niagara Falls is about 204,000 cubic feet per second.

The first company's franchise allowed 10,000 cubic feet a second, which, on account of more economical construction of the works, permits a development of 240,000 gross horse-power, or 180,000 net horse-power.

The New York company had 17,200 cubic feet per second, developing (multiplying by 24) a gross horse-power of about 400,000, a net electrical horse-power of about 200,000, the loss being due to method of construction.

Since alarm was felt in the United States at the impending destruction of the Falls, the Burton Bill was passed, prohibiting the temporary use of more power than was actually developed, although additional works were commenced, so that at present the two companies have 6,000 and 8,500 cubic feet per second, about 200,000 horse-power, net.

After the New York power companies began operations, at the instigation of Lord Dufferin, when Governor-General of Canada, it was proposed to make an international park at Niagara Falls, and through his influence the Ontario government secured the property on the western side of the falls. At the same time, certain New York gentlemen, with Hon. Andrew H. Green as moving spirit, secured the passage of a law by the New York legislature for making expropriations on the New York side. This is the Mr. Green known as the father of Greater New York, who at his untimely death in 1903, was president of the New York Niagara Commission, and whose

administration was marked by constant battles for the preservation of Niagara. So powerful were the influences in favor of the spoliation of the Falls, that these obtained from the Governor of New York a dismissal of all the Park Commissioners. But a friend of the Falls, finding this out, telegraphed Senator Platt, and Mr. Green was restored to his charge. Subsequently Mr. Green, observing the destruction of the Falls progressing on the Canadian side, drew up the bill for the present International Waterway Commission, but unfortunately his death prevented his taking charge of the movement he created for the express purpose of saving the Falls.

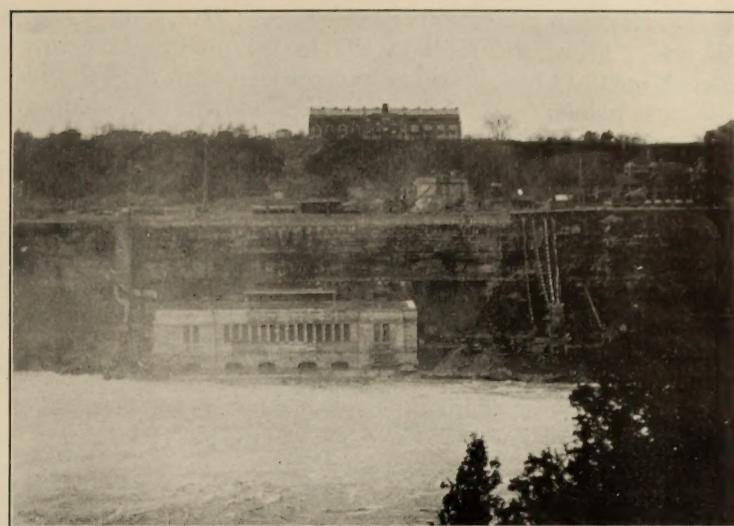
Some time after the construction of Niagara Falls Power Company a New York concern was again in Canada to operate. This company obtained from the Ontario government an exclusive franchise for power on the Canadian side, paying a rental of \$10,000 per year. The object was to keep any other company out of the field. This New York concern would tell Canada that they could have \$10,000 a year and have the Falls also. Later, however, the Ontario Power Company desired to acquire power rights, and methods were adopted to create a political furor, and the Canadian papers attacked the franchise not used, though no one seemed to want to use the power. This developed political conditions, so that the Ontario government broke the contract with the New York company, allowing, however, 110,000 horse-power and giving to the Ontario company about 250,000 horse-power. This led to the simultaneous construction of the works of the companies, so that the power could be turned on about 1905. In the meantime the Toronto interests wanted to use power, but there was no transmission line. So they obtained a charter for such a line, and tried to get power under satisfactory conditions from either the Canadian-Niagara or Ontario power companies, and at one time an agreement was almost reached

between the Toronto people and the Canadian - Niagara Company, which is a subsidiary company to the Niagara Falls Company of New York.

This falling through, they organized and built the Electrical Development Company of Ontario for their own use, and power has been used since the end of 1906.

Meanwhile there was a change of government in Ontario, and in the

course of time the slogan taken up by the Conservative government was "Cheap Power," with commission organized under Mr. Adam Beck, a manufacturer of cigar-boxes of London, Ontario. Since that time there has been an acrimonious contest wherein the government seemed to be determined to destroy the Electrical Development Company at all hazards, though the power was being conveyed to Toronto, the ostensible reason being that the Ontario Power Company offered to deliver to the government power at about \$10.40 per horse-power at Niagara, which was a slight reduction below the offer of the Electrical Development Company at Niagara. In this event, the government would have to build transmission lines. The Electrical Development Company was under contract with the government of Ontario, in consideration of building the works and paying rental amounting to about \$100,000 per year, that the government should not enter into competition in the development of power. In short, in the government's proposal to build transmission lines is that they are doing it for the Ontario Power Company, which had not



VIEW OF POWER-HOUSE OF ONTARIO COMPANY IMMEDIATELY BELOW THE HORSESHOE FALLS. (ABOUT ONE-THIRD PROPOSED SIZE.)

provided transmission lines for themselves, while the Electrical Company had provided them. This practically means competition and a broken contract for the benefit of the Ontario Power Company. This policy of the company would have wrecked the Electrical Development Company, and amounted to confiscation, had it not been taken over by the interests of the Canadian Northern Railway Company, which is electrifying their railway, and will thus make a greater demand on Niagara than the manufacturing interests. This will not benefit the manufacturing interests of Canada or New York, but will make further demands on Niagara for more railway purposes.

What does all this mean?

Before exploiting the Ontario Power Company, did the Premier of Ontario investigate the results? From what Dr. Spencer has shown, it is manifest that Premier Whitney did not take into account the effects on the Falls.

The Ontario Power Company is taking their water from the basin above the upper rapids, while the Electrical Development Company takes its water at a

point, after the rapids have fallen about fifty feet below the level of the basin. Let us see the effect of taking water from different points.

As Dr. Spencer points out, the real rock rim of Lake Erie is not at the outlet of the lake, but at the head of the Upper Rapids. The taking of the supply from the smooth water above the rapids has the same effect as the two New York companies taking their water through deep canals beside the same basin. This results in withdrawing the water from the shallower parts of the rapids, and also in lowering the level of Lake Erie and subsequently the higher lakes. Since 1890 the water has fallen a foot on the upper rapids, thus rendering very shallow the waters on the eastern side of the main cataract known as Canadian Horseshoe, and also reducing the depth of the American Falls a foot, so that during times of mean water in Lake Erie the water of the American Falls and on the eastern side of the Horseshoe Falls is in many places less than a foot in depth, and now great boulders appear above the surface, which were lately covered by water.

The distribution of the water on the Falls is entirely dependent on the inflow of the river of the Upper Rapids, where the depth is found to have diminished to a foot and a half even at high stages of water. Now, unfortunately for the friends of the Falls, there has been high water in the lakes from incessant rainfall during the last three or four years, which last year was extraordinarily high, so as to partly conceal the effects of lowering the water of the Falls. This has kept us from seeing a good deal of the harm being done. In fact, the water has risen so as to compare only with the high water of the summer of 1838.

If we turn to the table of fluctuations it is found that during the whole year of 1901, the mean level of Lake Erie was actually seventeen inches lower than it was last year. This would leave the water over a considerable portion of the

rim of the basin only a few inches deep, and consequently under the present division of power, would lower the Falls so that the shallower parts covering some hundreds of feet would be broken up into separate strings of water. This would actually occur with Lake Erie at the stages of 1901 or even higher; so that a person would dare walk near the edge of the Falls or on the present bed of the river, for some hundreds of feet from Goat Island.

We have no right to suppose that the recent increase of rainfall, not merely in the Lake region, but even as far south as Texas, is a permanent feature, and that the lake level will not again fall to the mean of that of the fifteen years from 1891 to 1905, inclusive, or occasionally to extreme low water.

We need not expect to wait for the full use of all the franchise power already granted. For even the restricted amount, under the Burton Bill, will cause the damage during the mean stages of water of 1891-1905 and still more the low water of 1901 referred to, since the present unused part under the "Burton Bill" and provincial agreement will cause a lowering of the water of the Falls more than that which has already occurred from the present power uses. In other words, it will double the loss, and this doubling of loss *will practically destroy the sheet of water over the entire American Falls and 800 feet on the eastern side of the Canadian Horseshoe Falls.*

It should be noted here that the Canadian (Niagara) Falls of Ontario have already been shortened by over 400 feet, mostly due to the Canadian Niagara Power Company. The effects of this shortening has already impaired the appearance of the Falls, when viewed from a point looking up the river, so that from a distance the diameter appears smaller than the American Falls, although two and a half times the circumference. Certain people have been wont to compare Niagara with Victoria Falls on the Zambesi in Africa, which reaches a mile



NIAGARA FALLS FROM ARCH BRIDGE.

The Canadian Falls lately extended to line A A, but now curtailed by power companies.

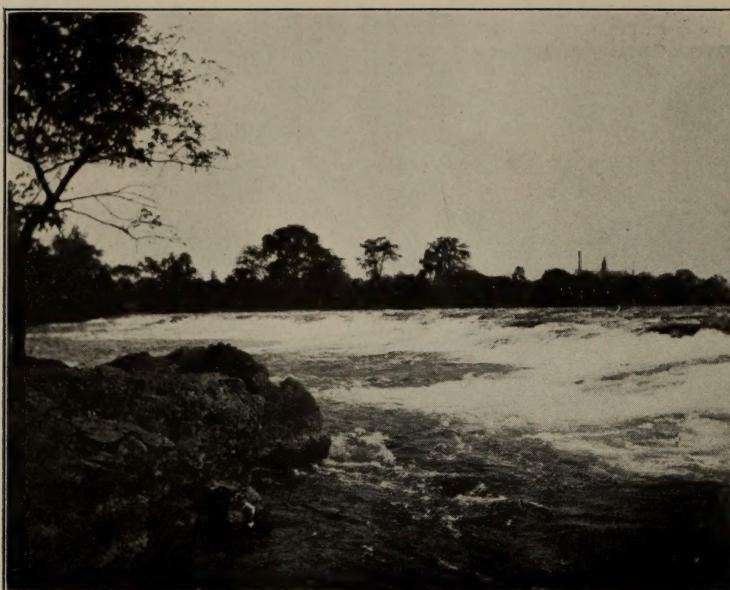
in length. These African falls are broken up by a very large number of small islands at the very edge, while the Niagara Falls are obstructed only by the little island of Luna and the larger Goat Island. But, including these, Niagara Falls had a breadth of a mile along the crest line before the curtailment of four hundred and fifteen feet for one of the present power companies. With the impending destruction of the Falls the total breadth will be reduced from over a mile to 1,600 feet in circumference, and a diameter of from 1,200 feet to 800 feet and what remains of the Falls will be all Canadian.

Are we to give our Falls away to Ontario and New York? Have we a right to do this, and have the Canadians a right, should they decide to lower the Falls, to dispossess American people?

And should the Canadians be able to divert the waters from Goat Island shore so as to destroy the riparian rights of the island?

But the chief forthcoming mischief herein outlined will not be entirely due to all the Canadian companies, for the Electrical Development Company and the Canadian Niagara take their water from points far below the Upper Rapids, so that they will not be responsible for the additional damage. But the responsibility will rest with the companies which take their water from the upper Rapids, Niagara Falls Hydraulic and Niagara Falls Power Company, the Ontario Power Company of Canada, and the Chicago, Welland & Erie Canals, which last drain but a small amount of water. As has been stated above, by the Burton Act, the two New York companies have had

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VIEW SHOWING SHEET OF WATER NEXT TO GOAT ISLAND.

their privileges reduced nearly one-half, but not so the Ontario Company, which as yet has developed but one-third of its franchise capacity.

The development of all the power under the unrestricted franchises of various companies incorporated and now using power (and they are, of course, trying to recover their restricted rights) will absolutely drain the eastern side of the Greater Falls and leave a few little miserable streams of water in the American Falls, and will also cause a further contraction of 200 feet on the Canadian side of the Horseshoe Falls as shown by Dr. Spencer's work.

No account is taken in this paper of the cost to navigation in lowering lake levels, harbors and canals. In this matter alone, leaving wholly out of the question the destruction of the American Falls, and the curtailment of those on the Canadian side, this diversion of power to five corporations, four of which are American companies (though operating in Ontario), will cost the United States and Canada upwards of \$25,000,000 in the mere matter of deepening the harbors

and canals to repair the damage to the present navigation, not to speak of its improvement.

Again, the number of visitors to the Falls varies greatly from year to year, but it ranges from 600,000 to 1,250,000, and the estimated expenditure in going and while at the Falls is taken at the modest sum of twenty dollars, which thus reaches a disbursement of \$25,000,000 in some years. The Falls are not the rich

people's property, but it is the masses who go there on excursions. Just think of closing Central Park, New York, although land there is not obtainable, while many other falls of little repute may be found.

In a recent Associated Press despatch the statement is made in an interview with Dr. Spencer that already Lake Erie has been lowered ten inches, although in his book which contains data down to two years ago he recorded the lowering of the lake then as eight inches. This loss of ten inches of water over the area of Lake Erie in a time of extraordinarily high water is insignificant, as at the present time, but not so during mean and low water. The author shows that the whole effect of this use of water which is being continually increased, will not be seen for some time afterwards. Now the quantity under permission is about two and a half times that resulting in use so that even with the restricted consumption the lowering of the lake will be such that the levels will sink two feet or more and, of course, in time Lakes Huron and Michigan will recede to the same



By permission of Baker Art Gallery, Columbus, Ohio.

VIEW OF NIAGARA FALLS (CANADIAN FALLS), LOW WATER, 1899.

Now shortened by 415 feet to A A, on Canadian side, due to power diversion. Future shortening will extend from Goat Island to B B. Cataract remaining will be located between A and B.

subsiding levels, seriously damaging all the harbors and canals. This point is of great political importance. On the ground of interference with navigable waters the whole matter may be taken up by the State Department, and Dr. Spencer furnishes the ground for an International arbitration.

The United States Engineers have estimated the lowering of the lakes by the Chicago Drainage Canal to the extent of six inches will require an outlay of \$12,000,000 to recoup the damages resulting to harbors and canals besides affecting smaller canals on which the government will not spend money. Thus it will be seen that the allowance of the present provisional quantities of diversion will cost at least \$25,000,000 and perhaps vastly more owing to the cost rapidly increasing in geometrical ratio to the sinking levels. The two New York companies have already been restricted, and their works are fully developed to their present allowance. On the Canadian side the Ontario company has its developments completed to about one-third of its franchise only, so that here curtailment could be best affected with proper pecuniary allowance. This company is now the adopted child of Premier Whitney, of Ontario.

On the other hand, the two lower power companies in Canada cannot affect the American Falls nor the lowering of the later lake levels, though somewhat impairing the deeper waters of the Falls. Here the Canadians can get their share of power without destruction to the Falls. Dr. Spencer shows that as a simple power question the Canadian has the larger share of power at the falls, but the question arises how can this be used if it is going to damage the navigation of the upper waters. I am able to see no reason why the Dominion Government should countenance the spoliation of the Falls and all for the benefit of five power companies, beyond its disinclination for political reasons to interfere with matters of Provincial concern. But when it becomes a matter not merely of Provincial interest, and affects Canada and all the shipping passing in and out of the Great Lakes, it becomes a question concerning the interstate commerce of the United States as well as West Canada, and on this ground the United States Government can make strong and effective representations to the government at Ottawa over the head of Premier Whitney, of Ontario, who seems to be heedless of the scientific warnings contained in Dr. Spencer's classic work.

Referring to the reports of the Canadian section of the International Waterways Commission one finds a protest against the vandalism of destroying the Falls, but it is intimated that so much water can be safely used without giving grounds for the opinion. In the report of the American section of the Commission it is admitted that the amount recommended is perilous, but an allowance is agreed upon, which was subsequently cut down under the Burton Act and the Taft rulings. Now Dr. Spencer's report differs from these and from all other reports accessible to me in that he gives quantitative measurements of the results which form the foundations of his conclusions. His opinions are, therefore, more convincing than those of any engineer or specialist whose opinions are not supported by the incontrovertible evidence of concrete fact. In fact, one engineer, of responsible position, says: "Yes, we are in high water; but we have no means of saying that low water will recur—although the high water of 1838 suddenly rose that year to subside in a year or two." In short, we have been too long at the mercy of mere opinions thrown in the limelight with the facts enveloped in the gloom of guess-work.

From the date of Dr. Spencer's book, it appears that it was nearly completed two years ago, and should have been published a year ago. But, unfortunately, it was held back. Why? It would be difficult to ascertain but easy

to guess. The first public notice of the obstruction appears in a mining journal in Toronto, November 15, 1907, containing a violent attack upon the forthcoming book, *as yet unpublished*, with apparently an effort to suppress it. Since the appearance of the book last January there has been a similar onslaught in a Western mining journal, apparently inspired by the same author. Both of these facts have been used in an attempt to suppress the book in Parliament since its publication. That the published work should have been attacked by any interest to whom its damning facts meant destruction is easy to understand as part of the game. But why the unpublished manuscript of an official of the scientific department of a nation should be publicly attacked is quite a different matter. I am reliably informed that there were only three people who had the right of access to an unpublished official manuscript; the author, who would hardly be disposed to criticize his own work; the Director of the Survey, who was very ill, and the editor, who has since been summarily dismissed by the Canadian Government.*

FRANK VROOMAN.

Washington, D. C.

*For the basis of this paper see Spencer's *Falls of Niagara, their evolution and varying relations to the Great Lakes: Characteristics of the Power and the Effects of Its Diversion*. By J. W. W. Spencer, Geological Survey of Canada, 1907. Also, the Reports of the International Waterway Commission, and the Toronto papers during the last year.